

Retroreflectors



Sensor Mounting Brackets



Sensor Accessory—AC Sensor Tester/Demonstrator



Pilot Device—E65 Control Unit



8.1 Retroreflectors and Retroreflective Tape

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Unless otherwise noted, the products contained in this section should not be used for functional safety applications. These products were not designed or tested to IEC 60947-5-3 or recommended for functional safety.



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Retroreflectors and Retroreflective Tape



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Retroreflectors and Retroreflective Tape

Product Description

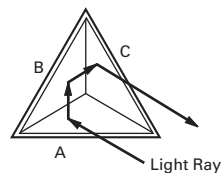
Retroreflectors from Eaton’s electrical sector are used with reflex-type sensors. Two types of retroreflective target material are available: corner cube and embedded glass bead.

Application Description

Corner Cube Retroreflectors

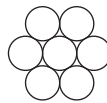
This type provides the highest signal return to the sensor, typically 2000 to 3000 times the reflectivity of white paper. Three adjoining sides are arranged at right angles to each other. When a ray of light strikes one of these sides (A), it is reflected to the second (B), then the third (C), and then back to the source parallel to its original course. Thousands of these cube shapes are molded into a rugged plastic reflector or vinyl tape material. Corner cube retroreflectors are suitable for use with both standard reflex and polarized reflex sensors.

Corner Cube



Retroreflector Size

The size of the retroreflective target has a significant effect on the excess gain and range of a reflex sensor. In general, we recommend you use the largest possible reflector in every reflex sensing application to maximize performance of the sensor and simplify alignment. To provide an even larger reflective area, multiple retroreflectors can be grouped together as shown.



7 Retroreflectors Grouped Together

Using Retroreflectors with Polarized Reflex Sensors

Only corner cube retroreflective material can be used with polarized reflex sensors. When polarized light from the sensor’s light source strikes a corner cube retroreflector, it is returned to the sensor in a depolarized state. This allows some of the light to pass through the detector’s polarizer, which is positioned at 90° to the source polarizer, to allow the sensor to operate.

Glass bead retroreflectors do not depolarize light and will not work with polarized reflex sensors.

Molded plastic corner cube retroreflectors are always recommended as they provide the highest signal return to the sensor.

Corner cube tape works with polarized reflex sensors but returns less light to the sensor. In all cases, Eaton recommends testing sensor and tape prior to final installation.

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Product Selection**Retroreflectors**

6200A-6507

**Corner Cube Retroreflector**

| Description | Catalog Number |
|---|----------------|
| 1.5 x 3.25 in, adhesive backed, one per package | 6200A-6507 |

Round Retroreflectors

6200A-6501



| Description | Catalog Number |
|---|----------------|
| 3 in diameter, with mounting hole, two per package | 6200A-6501 |
| Bulk packaged version of above (ordered quantity will be bulk packaged) | 6200AS6501 |
| 3 in diameter, with mounting hole, one per package | E51KR84 |

6200A-6506



| | |
|--|------------|
| 3 in diameter, metal backed, with mounting hole, one per package | 6200A-6506 |
|--|------------|

6200A-6505



| | |
|---|------------|
| 2.18 in diameter, with mounting hole, one per package | 6200A-6505 |
|---|------------|

6200A-6502



| | |
|--|------------|
| 2.18 in diameter, adhesive backed, one per package | 6200A-6502 |
|--|------------|

6200A-6504



| | |
|--|------------|
| 1.25 in diameter, adhesive backed, one per package | 6200A-6504 |
| Bulk packaged version of above (ordered quantity will be sent bulk packaged) | 6200AS6504 |
| 1.25 in diameter, no adhesive, one per package | E51KR32 |

Retroreflective Tape

6204A-XXXX

**Corner Cube Style** ^①

| Description | Catalog Number |
|--|----------------|
| 2 in wide, 1 piece, quantity is length in feet | 6204A-XXXX |

Note

① Although corner cube tape works with polarized reflex sensors, we recommend testing sensor and tape prior to installation.

8.1

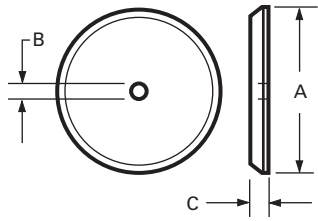
Sensor Accessories

Retroreflectors and Retroreflective Tape

Dimensions

Approximate Dimensions in Inches (mm)

Round Retroreflectors



| Catalog Number | Diameter A | Hole Size B | Thickness C |
|----------------|---------------|----------------|----------------|
| 6200A-6501 | 3.30 (84) | 0.20 (5) | 0.35 (9) |
| 6200A-6502 | 2.40 (61) | None | 0.30 (7.5) |
| 6200A-6504 | 1.30 (33) | None | 0.25 (6) |
| 6200A-6505 | 2.40 (61) | 0.25 (6) | 0.30 (7.5) |
| 6200A-6506 | 3.30 (84) | 0.20 (5) | 0.30 (7.5) |
| E51KR32 | 1.25 (32) | None | 0.35 (9) |
| E51KR84 | 3.30 (84) | 0.20 (5) | 0.35 (9) |

Sensor Mounting Brackets**Contents**

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Sensor Mounting Brackets**Product Description**

Mounting brackets by Eaton's electrical sector found in this section are suited for use with 8 mm to 30 mm diameter tubular sensors only. Mounting brackets designed to specifically fit other types of sensors are found in the respective "Accessories" sections for those sensor families.

Product Selection Guide

When choosing a bracket, consider:

- **Adjustability**—Do you need minimal alignment capability (mounting an inductive proximity sensor), or a high level of alignment precision (mounting a long range photoelectric thru-beam sensor)?
- **Material of Construction**—This can be dictated by the sensing environment or the type of sensor you are using

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Product Selection

Sensor Mounting Brackets

Mounting Brackets for Tubular Sensors

| | Description | Size | Catalog Number | |
|--|---------------------------------------|--|----------------|-------------------|
| L-Shaped Bracket  | L-Shaped Bracket—E57KM_ | | | |
| | Adjustability: | Allows some adjustment in two axes | 8 mm | E57KM8 |
| | Sensor mounting: | Sensor mounts with two jam nuts and washers ① | 12 mm | E57KM12 |
| | Material of construction: | Stainless steel | 18 mm | E57KM18 |
| | Packaging: | One per package | 30 mm | E57KM30 |
| L-Shaped Bracket  | L-Shaped Bracket—6161A_ | | | |
| | Adjustability: | Allows some adjustment in one axis and allows for aiming of the sensor through a short arc | 18 mm | 6161A-6501 |
| | Sensor mounting: | Sensor mounts with two jam nuts and washers ① | | |
| | Material of construction: | Aluminum with chromate finish | | |
| L-Shaped Bracket  | Packaging: | Two per package | | |
| | Packaging: | Same as 6161A-6501 (above), except: Bulk packaged (ordered quantity will be sent bulk packed) | 18 mm | 6161AS6501 |
| L-Shaped Bracket  | L-Shaped Bracket—6167A | | | |
| | Adjustability: | Allows a minimum range. Suitable for 30 mm sensors. | 30 mm | 6167A-6501 |
| | Sensor mounting: | Allows some adjustment in one axis | | |
| | Material of construction: | Zinc dichromate | | |
| L-Shaped Bracket with Slot  | L-Shaped Bracket with Slot ② | | | |
| | Adjustability: | Allows some adjustment in one axis and allows for aiming of the sensor through a short arc | 18 mm | 6161AS7050 |
| | Sensor mounting: | Sensor mounts with two jam nuts and washers ① | | |
| | Material of construction: | Aluminum with chromate finish | | |
| Flat Bracket  | Packaging: | Bulk packaged (ordered quantity will be sent bulk packed) | | |
| | Packaging: | Bulk packaged (ordered quantity will be sent bulk packed) | | |
| Adjustable Bracket  | Adjustable Bracket—E58KAM18_ ③ | | | |
| | Adjustability: | Locking vertical and horizontal adjustments for independent adjustments in each axis | 18 mm | E58KAM18 |
| | Sensor mounting: | Sensor mounts with two jam nuts and washers ① | | |
| | Material of construction: | 304 stainless steel | | |
| | Packaging: | One per package | | |
| | | Same as E58KAM18 , except not electrically isolated from mounting surface | 18 mm | E58KAM18U |

Dimensions, see **Page V8-T8-8**.



Notes

① Included with sensor.

② Allows installation of sensor with jam nuts already in place on sensor body, (Comet® and Prism™ sensors only).

③ Sensor is electrically isolated from mounting surface.

Mounting Brackets for Tubular Sensors, continued

| | Description | Size | Catalog Number |
|---|--|-----------------|-------------------|
| Adjustable Bracket  | Adjustable Bracket—E58KAM30 ① | | |
| | Adjustability: Locking vertical and horizontal adjustments for independent adjustment in each axis | 30 mm | E58KAM30 |
| | Sensor mounting: Sensor mounts with two jam nuts ② | | |
| | Material of construction: 304 stainless steel | | |
| | Packaging: One per package | | |
| | Same as E58KAM30 , except not electrically isolated from mounting surface. | 30 mm | E58KAM30U |
| 18 mm Ball Swivel Bracket  | 18 mm Ball Swivel Bracket | | |
| | Adjustability: Allows 360° rotation and 10° vertical tilt | 18 mm | E58KAM18B |
| | Sensor mounting: Mounts directly to any 18 mm threaded sensor | | |
| | Material of construction: 5% glass filled Valox® | | |
| | Packaging: One per package | | |
| Metal Ball Swivel Mount  | Metal Ball Swivel Mount ③ | | |
| | Adjustability: Allows 5.5° rotation with screw lock to fix final position | 0.75 in (18 mm) | 6168A-6501 |
| | Sensor mounting: Mounts directly to any 18 mm tubular sensor | | |
| | Material of construction: Extremely rugged, made from zinc plated steel/Celenex® | | |
| | Packaging: One per package | | |
| Plastic Ball Swivel Mount  | Plastic Ball Swivel Mount—6143A | | |
| | Adjustability: Allows 10° rotation on X and Y axes with a clamping action to hold adjustment | 0.375 in (8 mm) | 6143A-6501 |
| | Sensor mounting: Mounts directly to any 8 mm tubular sensor | | |
| | Material of construction: Noryl ④ | | |
| | Operating temperature: -40° to 160°F (-40° to 71°C) | | |
| | Packaging: One per package | | |
| Plastic Ball Swivel Mount  | Plastic Ball Swivel Mount—6142A | | |
| | Same as 6143A-6501 (above), except: | 0.75 in (18 mm) | 6142A-6501 |
| | Sensor mounting: Mounts directly to any 18 mm tubular sensor | | |
| Cushioned Sensor Mounts  | Cushioned Sensor Mounts | | |
| | Precision machined, spring-loaded sleeves that hold tubular sensors to protect them from accidental impact due to overtravel of the target being sensed. | 8 mm | E57KNZ8 |
| | | 12 mm | E57KNZ12 |
| | Used for inductive proximity sensors only. | 18 mm | E57KNZ18 |
| | | 30 mm | E57KNZ30 |

Dimensions, see **Page V8-T8-8**.

Notes

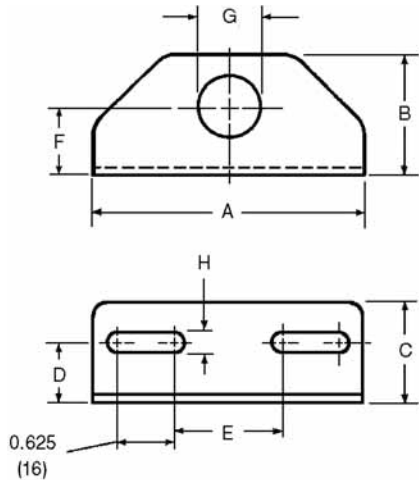
- ① Sensor is electrically isolated from mounting surface.
- ② Included with sensor.
- ③ Electrically isolates the sensor to prevent noise pick-up caused by poor grounding.
- ④ Avoid exposing to chlorinated halogenated or aromatic hydrocarbons.

Dimensions

Approximate Dimensions in Inches (mm)

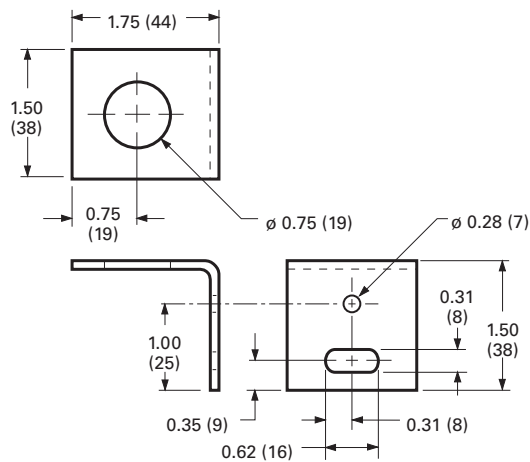
Sensor Mounting Brackets for Tubular Sensors

L-Shaped Bracket—E57KM

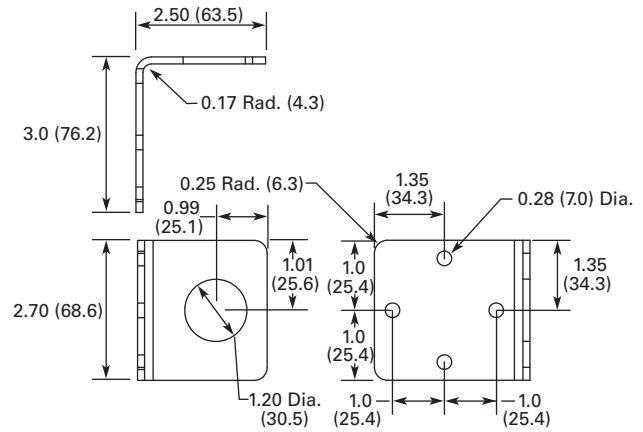


| Size | A | B | C | D |
|-------|------------|-----------|------------|-----------|
| 8 mm | 3.00 (76) | 1.35 (34) | 1.125 (29) | 0.65 (17) |
| 12 mm | 3.00 (76) | 1.35 (34) | 1.125 (29) | 0.65 (17) |
| 18 mm | 3.00 (76) | 1.35 (34) | 1.125 (29) | 0.65 (17) |
| 30 mm | 4.25 (108) | 2.15 (55) | 1.75 (45) | 1.00 (25) |
| | E | F | G | H |
| 8 mm | 1.20 (31) | 0.75 (19) | 0.323 (8) | 0.218 (6) |
| 12 mm | 1.20 (31) | 0.75 (19) | 0.484 (12) | 0.218 (6) |
| 18 mm | 1.20 (31) | 0.75 (19) | 0.718 (18) | 0.218 (6) |
| 30 mm | 2.00 (51) | 1.25 (29) | 1.203 (30) | 0.281 (7) |

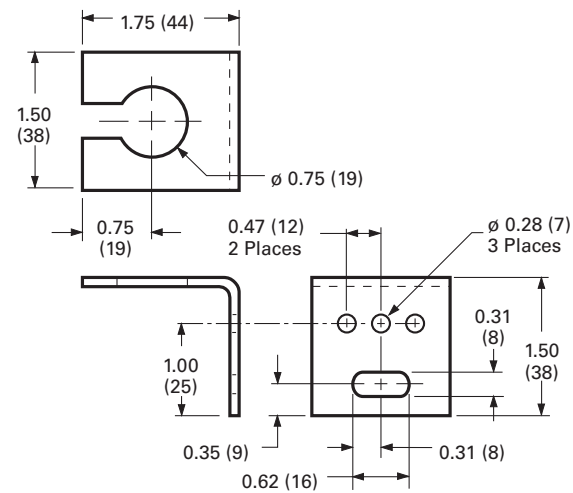
L-Shaped Bracket—6161A



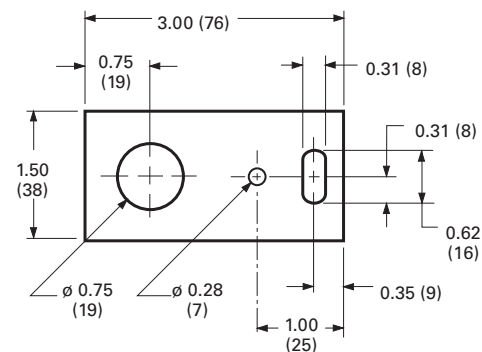
L-Shaped Bracket—6167A



L-Shaped Bracket with Slot

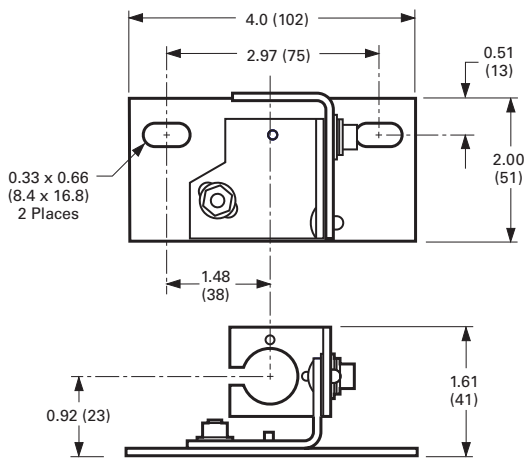


Flat Bracket

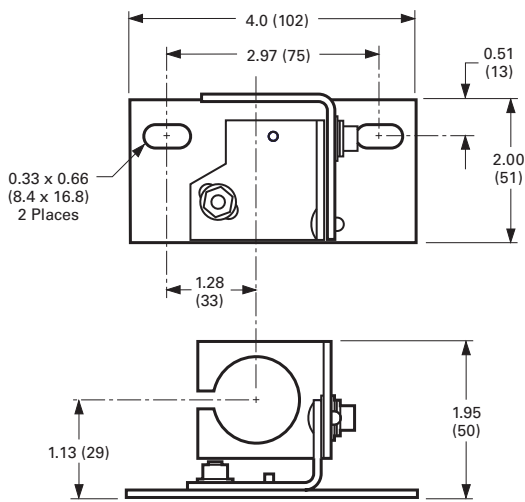


Approximate Dimensions in Inches (mm)

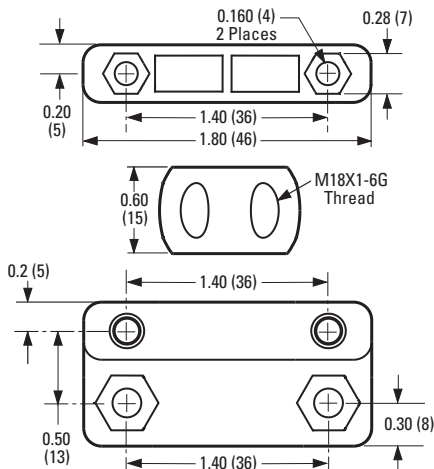
Adjustable Bracket—E58KAM18



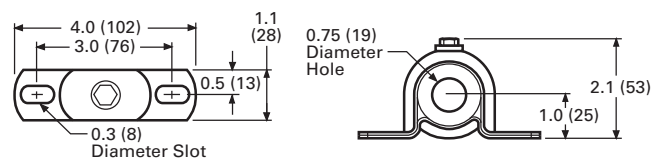
Adjustable Bracket—E58KAM30



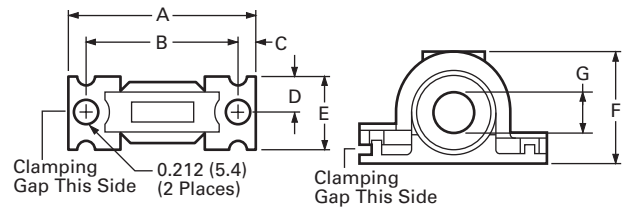
18 mm Ball Swivel Bracket



Metal Ball Swivel Mount



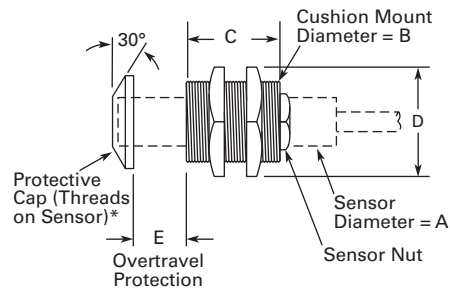
Plastic Ball Swivel Mount



| Size | A | B | C | D |
|-------|-------------|-------------|-------------|-------------|
| 8 mm | 1.96 (49.8) | 1.56 (39.6) | 0.20 (5.1) | 0.40 (10.2) |
| 18 mm | 2.80 (71.1) | 2.25 (57.2) | 0.275 (7.0) | 0.50 (12.7) |

| | E | F | G |
|-------|-------------|-------------|-------------|
| 8 mm | 0.80 (20.3) | 1.05 (26.7) | 0.375 (9.5) |
| 18 mm | 1.00 (25.4) | 1.64 (41.7) | 0.75 (19.1) |

Cushioned Sensor Mounts ①



| Size | A | B | C | D | E |
|-------|-----------|-----------|-----------|-----------|-----------|
| 8 mm | M8 x 1 | M16 x 1.5 | 0.87 (22) | 0.87 (22) | 0.35 (9) |
| 12 mm | M12 x 1 | M22 x 1.5 | 0.87 (22) | 1.12 (29) | 0.41 (10) |
| 18 mm | M18 x 1 | M30 x 1.5 | 1.17 (30) | 1.41 (36) | 0.49 (12) |
| 30 mm | M30 x 1.5 | M47 x 1.5 | 1.47 (37) | 1.72 (51) | 0.57 (15) |

Note
 ① Sensing range will be reduced by thickness of cap's wear surface: 0.030 in (0.76 mm) maximum.

Sensor Accessories



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Sensor Accessories



Product Description

Accessories from Eaton's electrical sector include portable power supplies for testing or demonstrating DC sensors, a variety of

replacement mounting nuts, protective end caps for tubular proximity sensors, and conduit adapters for tubular sensors.

Product Selection

Sensor Accessories

| | Description | Catalog Number |
|---|--|--------------------------|
|  <p>DC Sensor Tester/Demonstrator</p> | <p>DC Sensor Tester/Demonstrator</p> <p>For two-, three- and four-wire DC sensors Provides 27 Vdc power from three 9V batteries (included) Test output connections for both NPN and PNP outputs</p> | <p>9902A-6501</p> |
|  <p>AC Sensor Tester/Demonstrator</p> | <p>AC Sensor Tester/Demonstrator</p> <p>For AC sensors Provides AC power from wall mount Includes AC adapter</p> | <p>9902A-6502</p> |
| <p>Dimensions, see Page V8-T8-12.</p> | | |

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Sensor Accessories, continued

| | Description | Sensor Diameter | Catalog Number |
|--|---|---------------------------------|---|
| Mounting Nut, E57KN_  | Replacement Mounting Nuts—Stainless Steel, E57KN_ Where used: Harsh environment for tubular sensors Material of construction: Stainless steel Packaging: Two per package | 8 mm 12 mm 18 mm 30 mm | E57KNM8 E57KNS12 E57KNS18 E57KNS30 |
| Mounting Nut, E60KN18  | Replacement Mounting Nuts—Brass Where used: General purpose for tubular sensors ① Material of construction: Brass Packaging: Two nuts and two wave washers per package | 18 mm | E60KNS18 |
| Mounting Nut, E58KN_  | Replacement Mounting Nuts—Stainless Steel, E58KN_ Where used: Harsh environment for tubular sensors Material of construction: Stainless steel Packaging: Two per package | 18 mm 30 mm | E58KNS18 E58KNS30 |
| Mounting Nut, E57KNC18  | Replacement Mounting Nuts—Plastic Where used: Harsh environment for tubular and SM series sensors Material of construction: Plastic Packaging: Two per package | 18 mm | E57KNC18 |
| Protective Cap, E57KP_  | Protective Caps—E57KP_ Where used: Tubular Proximity Sensors Material of construction: Delrin Packaging: One per package | 12 mm 18 mm 30 mm | E57KP12 E57KP18 E57KP30 |
| Conduit Adapter, E57KC_  | Conduit Adapters—E57KC_ Where used: To attach electrical conduit to rear of tubular sensors Material of construction: Die cast steel Packaging: One adapter and nut per package | 8 mm 12 mm 18 mm 30 mm | E57KC8 E57KC12 E57KC18 E57KC30 |
| Conduit Adapter, E58KC30  | Conduit Adapters—E58KC30 Where used: To attach E58 harsh duty 30 mm sensors to half-inch conduit fittings Material of construction: Stainless steel Packaging: One per package | 30 mm | E58KC30 |
| Dimensions, see Page V8-T8-12. | | | |

Note

① These are the standard mounting nuts shipped with the Comet, Prism and OEM Prism photoelectric sensors.

Dimensions

Approximate Dimensions in Inches (mm)

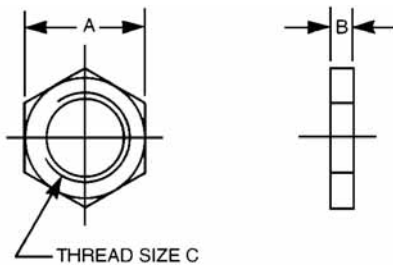
DC Sensor Tester/Demonstrator

| W | H | D |
|----------|------------|----------|
| 2.5 (65) | 4.75 (120) | 2.1 (55) |

AC Sensor Tester/Demonstrator

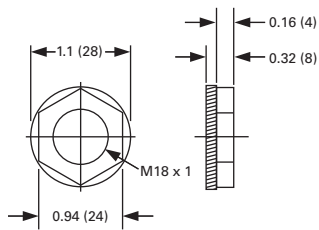
| W | H | D |
|----------|-----------|----------|
| 2.5 (65) | 4.5 (114) | 1.5 (38) |

8 Replacement Mounting Nuts—Stainless Steel and Brass

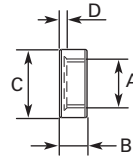


| Size | A | B | C |
|-------|-----------|----------|-----------|
| 8 mm | 0.5 (13) | 0.16 (4) | M8 x 1 |
| 12 mm | 0.7 (17) | 0.16 (4) | M12 x 1 |
| 18 mm | 0.94 (24) | 0.16 (4) | M18 x 1 |
| 30 mm | 1.4 (36) | 0.16 (4) | M30 x 1.5 |

Replacement Mounting Nuts—Plastic

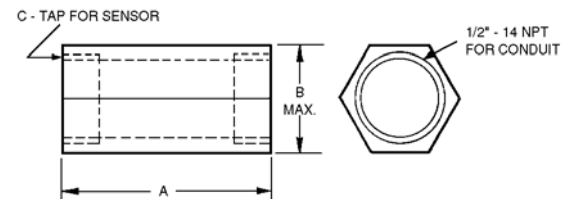


Protective Caps



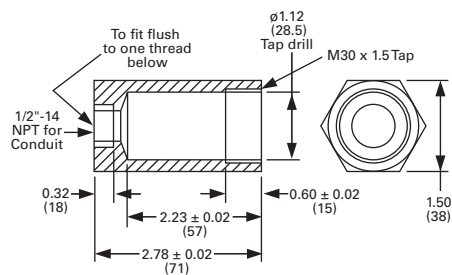
| Size | Switch Size A | B | C | Thickness D |
|-------|---------------|------------|-------------|-------------|
| 12 mm | 0.47 (12) | 0.39 (10) | 0.63 (16) | 0.04 (1.0) |
| 18 mm | 0.71 (18) | 0.36 (9.2) | 0.83 (21.2) | 0.04 (0.9) |
| 30 mm | 1.18 (30) | 0.59 (15) | 1.42 (36) | 0.07 (1.7) |

Conduit Adapters—E57KC_



| Size | Length A | Hex B | Tap C |
|-------|----------|----------|-----------|
| 8 mm | 1.0 (25) | 1.0 (25) | M8 x 1 |
| 12 mm | 1.5 (38) | 1.0 (25) | M12 x 1 |
| 18 mm | 1.5 (38) | 1.0 (25) | M18 x 1 |
| 30 mm | 1.9 (48) | 1.5 (38) | M30 x 1.5 |

Conduit Adapters—E58KC30



Pilot Devices



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Pilot Devices

Product Description

Type E65 control units from Eaton’s electrical sector are designed for use with amplifier built-in sensors to provide an SPDT relay contact output (in addition to the solid-state output of the sensor), and to convert an

AC input voltage to stable 12 Vdc, permitting operation of a DC sensor from an AC input. Use only with NPN output sensors. A switch is provided in the output circuit for selecting either light or dark sense operation. These

control units are available with or without a selectable ON-delay, OFF-delay or one-shot timer having an adjustable timing range of 0.1 to 5 seconds. A red LED indicator glows when the output relay is energized.

Product Selection

E65 Control Unit

E65 Control Units



| Voltage | Output Configuration | Features | Catalog Number |
|---|--------------------------------|---------------------------|-------------------------------|
| 110 to 120V/220 to 240 Vac ± 10%, 50/50 Hz | Selectable light or dark sense | SPDT relay contact output | With external synchronization |
| | | | With delay timer ① |
| | | | Without delay timer |
| | | | E65PS |

Note

① Selectable for ON-delay, OFF-delay or ONE-SHOT operation with an adjustable timing range of 0.1 to 5 seconds.

For the most current information on this product, visit our Web site: www.eaton.com

For Customer Service in the U.S. call 1-877-ETN CARE (386-2273), in Canada call 1-800-268-3578. For Application Assistance in the U.S. and Canada call 1-800-426-9184.

Technical Data and Specifications

Pilot Devices

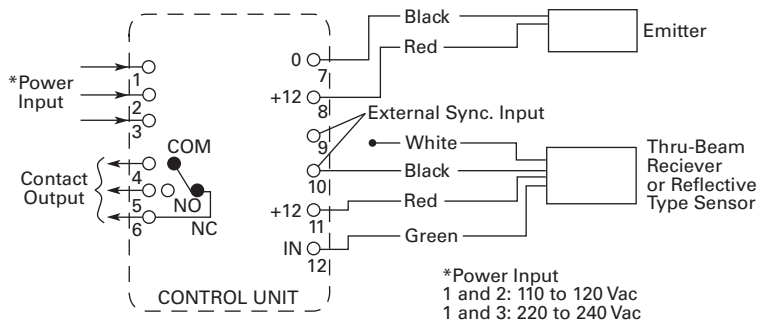
| Description | Specification |
|---------------------------------------|--|
| Input voltage | 110 to 120V/220 to 240 Vac \pm 10%, 50/60 Hz |
| Temperature range | 14° to 122°F (-10° to 50°C) |
| Relative humidity | Less than 85% |
| Response time | Less than 20 ms |
| Output voltage | 12 Vdc \pm 10%, 100 mA maximum |
| Short-circuit and polarity protection | Incorporated |
| Power consumption | Less than 8 VA |
| Terminal connections | Screw and saddle clamp to accept 14 AWG wire |
| Output | SPDT relay contact rated 3A resistive at 250 Vac |

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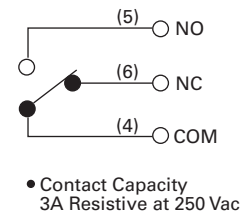
Wiring Diagrams

Pin numbers are for reference, rely on pin location when wiring.

Output Circuits and Connections



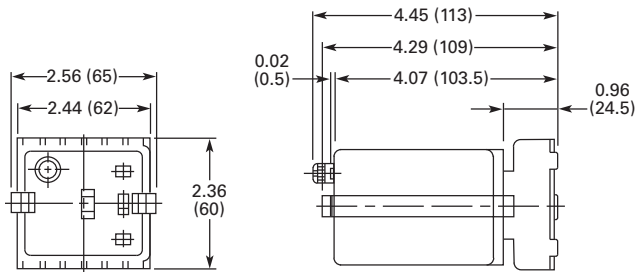
Relay Contact Output



Dimensions

Approximate Dimensions in Inches (mm)

Control Unit



Socket with Terminals

